23th – 24th SEPTEMBER 2019 | HAMBURG

Conference on **Mobility in a Globalised World**

Mobility in a
Globalised World
2019

> MOBILITY DRIVES SECURITY

PROGRAM

> LOCATION

Akademie der Polizei Hamburg
Braamkamp 3b
22297 Hamburg
Building HSG I (PAZ), Lecture Hall 505/506

> LOCAL ORGANISATION MIGW 2019

Prof. Dr. Wilfried Honekamp, Academy of Hamburg Police
E-mail: wilfried.honekamp@polizei-studium.org
Further information: www.migw.info

> SCIENTIFIC COMMITTEE

Prof. Niels Biethahn
DHBW Heilbronn
IAF

Prof. Laurent Guihéry
Université de Cergy-Pontoise, France

Prof. Wilfried Honekamp
Academy of Hamburg Police, Germany

Prof. Günter Koch
Humboldt Cosmos Multiversity, Spain

Dr. Reinhard Kolke
ADAC

Prof. Jan Muntermann
University of Göttingen

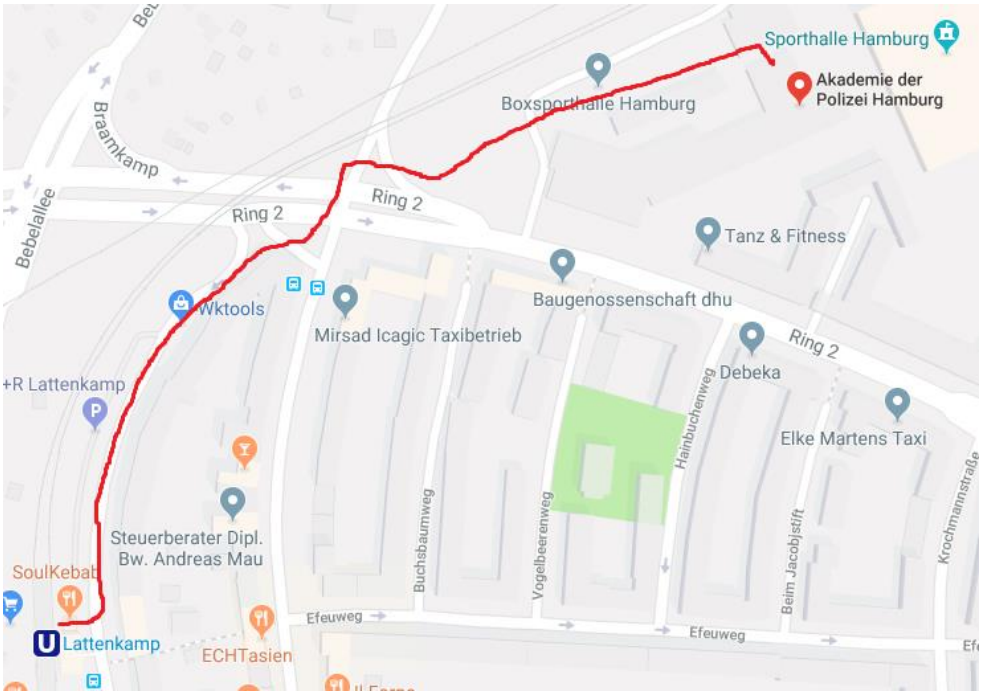
Prof. Eric Sucky
University of Bamberg

Prof. Michael Vogelsang
University of Applied Sciences Ruhr-West

Prof. Jan Werner
Cologne Business School

> VENUE

The Academy is located in Hamburg-Alsterdorf, next to the Hamburg Police headquarters, in 3 km distance to the international airport Hamburg-Fuhlsbüttel, and only a few metro stations far from Hamburg city centre at U1 (Lattenkamp).



Source: Google Maps

Akademie der Polizei Hamburg, Braamkamp 3b, 22297 Hamburg

For car parking follow the instructions for “Sporthalle Lattenkamp”.

Source: Google Maps

> MONDAY, 23. SEPTEMBER 2019

12.00 Registration and possibility for Lunch

12.30 Welcome remarks: Kristin Pfeffer, Dean of the University of Applied Sciences in the Academy of Hamburg Police

12:45 Panel I: Mobility in computer science (Wilfried Honekamp, Günter Koch)

Tobias Cors: Simulation-based Capacity Planning of Police Forces
Lars Damm & Wilfried Honekamp: Security Monitoring in Port Logistics IT
Jonathan Reimers & Wilfried Honekamp: Analysis of the Risk of NFC Payment Systems

14:15 Coffee Break

14:30 Panel II: Mobility in Business Economics

a) (Ivonne Honekamp)

Ivonne Honekamp: Temporary Personnel Services in Operating Theatre Nursing
Volker Busch: Management Cockpit: A New Step of the Development of Monitoring Approaches
Florian W. Kempf: The new German equalisation system for the federal states

b) (Jan Werner)

Jan Werner: Local Public Finance in Libya: Learn to walk before you run
Christian Lucas: Mobility Compass: An empirical survey of the development of student´s values regarding e-mobility
Mariana Fleischhauer Corrêa da Costa: The Internationalisation Process of German Enterprises in Brazil: A brief empirical overview

16:00 Coffee Break

16:15 Panel III: Mobility in Logistics (Eric Sucky)

Christian Straubert & Julia Metz: Technologies and Processes Used by Food Delivery Services in Germany
Stefan Motschenbacher & Vanessa Felch: Die unternehmens-interne Logistik im Kontext der Digitalisierung und Industrie 4.0
Andreas Ott & Alexander Dobhan: Acceptance of web-based EDI applications by small and medium-sized enterprises

17:45 Conclusion of the first day (Jan Werner)

19:30 Hamburg evening: Dinner in Restaurant Waterkant, Empire Riverside Hotel, Bernhard-Nocht-Straße 97, 20359 Hamburg

> TUESDAY, 24. SEPTEMBER 2019

09.30 Guided Tour at the Hamburg Police Museum,
Carl-Cohn-Straße 39, 22297 Hamburg

11:00 Panel VI: Mobility in Engineering (Reinhard Kolke)
Thomas Willner: Climate Protection in the Transport Sector – The Key Role of Alternative Fuels
Anika Sievers & Thomas Willner: Fuels from Waste and Hydrogen – The HAW Hamburg Approach
Michael H. Feldmann: A new Negative Emission Technology (NET) producing at low cost large amounts of negative CO2-Emissions and large amounts of 100%-GHG-neutral BioMethane for the transportation sector

12:30 Final conclusion of the conference (Wilfried Honekamp)

> LIST OF PARTICIPANTS

Prof. Dr. Volker Busch (Fachhochschule der öffentlichen Verwaltung in Nordrhein-Westfalen und Hochschule des Bundes, Brühl), Tobias Cors (Universität of Hamburg), Lars Damm (Hamburger Hafen und Logistik AG), Prof. Dr. Alexander Dobhan (University of Applied Sciences Würzburg-Schweinfurt), Vanessa Felch (University of Bamberg), Michael H. Feldmann (Phoenix-IP B.V. & Clean Mobility Systems), Mariana Fleischhauer Corrêa da Costa (Cologne Business School), Prof. Dr. Wilfried Honekamp (Academy of Hamburg Police), Prof. Dr. Ivonne Honekamp (University of Applied Sciences Stralsund), Florian W. Kempf (Bildungs- und Wissenschaftszentrum der Bundesfinanzverwaltung Münster), Prof. Günter Koch (Humboldt Cosmos Multiversity), Dr. Reinhard Kolke (ADAC), Prof. Dr. Christian Lukas (IUBH Duales Studium Düsseldorf), Stefan Motschenbacher (University of Bamberg), Andreas Ott (University of Applied Sciences Würzburg-Schweinfurt), Prof. Dr. Kristin Pfeffer (Academy of Hamburg Police), Jonathan Reimers (Academy of Hamburg Police), Niels Sahling (Academy of Hamburg Police), Prof. Dr. Anika Sievers (Hamburg University of Applied Sciences), Christian Straubert (University of Bamberg), Prof. Dr. Eric Sucky (University of Bamberg), Prof. Dr. Michael Vogelsang (Ruhr West University of Applied Sciences), Prof. Dr. Jan Werner (Cologne Business School and ILPF), Prof. Dr.-Ing. Thomas Willner (Hamburg University of Applied Sciences)

> ABSTRACTS

Panel I: Mobility in computer science

Simulation-based Capacity Planning of Police Forces

Tobias Cors (Universität Hamburg)

In the planning of police forces an adequate allocation of resources to districts is crucial for providing an effective and robust service and for maintaining acceptable emergency response times. Due to the high operational heterogeneity and variability, determining reliable profiles for resource utilization and establishing their relationship to response times is a challenging task in and of itself that requires an adequate consideration of several sources of stochastic influence. Based on an extensive dataset comprising more than two million items, we estimate stochastic process models for all relevant police operations in a major metropolitan area and use a discrete-event simulation to analyse capacity utilization of a given fleet of police vehicles. The simulation model predicts the spatial and temporal occurrence of police operations and dispatches available vehicles from different districts, in order to model resource sharing in emergency response. The vehicle allocation is then optimized via a rule-based heuristic, observing shift patterns and local demand structure, until response time expectations are met. We provide preliminary experimental results and draw implications with respect to current capacities and future utilization.

Security Monitoring in Port Logistics IT

Lars Damm (Hamburger Hafen und Logistik AG) &
Wilfried Honekamp (Academy of Hamburg Police)

Hackers and cyber-attacks are becoming an increasing threat to the port industry, whose progressive digitisation further increases sensitivity to such risks. By implementing the SmartPort, that means the networking of the port and logistics sector with the just-in-time production processes of the industry in the hinterland, the industry becomes vulnerable to cyber-attacks with enormous economic and business costs. Port industry companies have numerous powerful IT security tools that do not adequately reflect port-specific security requirements. In addition, coordination of various IT security tools cannot currently be mapped; the detection of attacks that are made up of various anomalies is not recognized or recognized too late. An innovative, cross-company linkage of the various existing IT security tools will substantially improve the detection and defence against cyber-attacks on the IT systems of the German port handling companies. In addition, the extensive and qualified data generated in this process would significantly support the work of the Federal Office for Information Security (BSI) as the central reporting office for information technology security in critical infrastructures. Therefore, the partners Hamburger Hafen und Logistik AG (HHLA), DAKOSY and Hamburg University as well as EUROGATE and the Academy of Hamburg Police as associate partners have come together in the three-year program HITS-Moni to bundle the different competencies and resources and to develop new concepts and procedures as well as a software demonstrator. HITS-Moni is funded by the program for innovative port technologies (Innovative Hafentechnologien - IHATEC). It will focus on the specifics of the port industry, which can lead to a significant increase in the security and reliability of IT systems in the event of subsequent development and implementation in port management. In this contribution, the concepts and first approaches of linkage of different IT tools based on port-specific vulnerabilities and risks, leading to automatic anomaly detection and a reduction in the number of insignificant security alerts and identification of novel attack patterns are introduced.

Analysis of the Risk of NFC Payment Systems

Jonathan Reimers & Wilfried Honekamp
(Academy of Hamburg Police)

This contribution examines the question of whether manipulation of NFC payment systems is possible, whether existing security measures adequately protect this technology, and to what extent criminality in this area has already progressed. As information technology penetrates more and more areas of everyday life, this inevitably leads to new risks and dangers. This, in turn, poses new challenges to law enforcement agencies, as any specialized IT crime has to be readjusted. Initial experimental studies have already identified security risks in NFC technology. However, there are many more potential risks to check. This article describes the study of one of these risk areas.

Based on an experiment, it was examined to what extent the interception of credit cards via NFC with a standard smartphone is possible. Different situations were simulated. Afterwards it was examined whether with the obtained data goods could be ordered and paid in different Internet shops. As a result, it becomes clear that reading out the credit card data by means of the NFC function of a commercially available smartphone is quite possible and, depending on the respective carrying situation, promises a high probability of success. The use of the obtained data, for example for the purchase of electronic articles, is also possible. However, it also becomes apparent that the level of crime in this technology area is low and the risk of becoming a victim of an NFC-related crime is still relatively low.

The processing of this topic has shown the need for further experimental research. Despite the low risk of becoming a victim of an NFC-related crime, non-existent education of the population about potential risks is considered questionable and should be improved by law enforcement agencies.

Panel II: Mobility in Business Economics

Temporary Personnel Services in Operating Theatre Nursing

Ivonne Honekamp (University of Applied Sciences Stralsund)

Healthcare is one of the largest employment sectors in Germany. Nurses make up the quantitatively largest occupational group. At the same time, however, a serious shortage of skilled workers can be observed in this area. According to the Federal Employment Agency, around 15,700 vacant nursing jobs were registered in 2018, an increase of 7% compared to the previous year. Through economization, privatization and reforms in the billing system of health care facilities, the structures and conditions for care have changed. High quality work must be provided under increased time and financial pressure with fewer and fewer personnel, due to the shortage of skilled workers. The additionally increasing demand for health services leads to a work-concentration up to the overloading of the nursing staff. The resulting emigration of nurses amongst others into the temporary employment agencies has consequences for hospitals. Therefore, the proportion of temporary workers in the total workforce in German hospitals is constantly increasing and Minister of Health Jens Spahn brought up the prohibition of temporary employment in the healthcare sector, in order to regain more personnel for the clinics and to increase the quality of care. This contribution uses a survey to analyse the motivations of those who have decided against a permanent position in the hospital in favour of a position in temporary employment. By switching to temporary work, nurses expect flexibility, good pay and improved work-life balance. The vast majority of temporary workers report that their expectations of temporary work have been met, and more than half even report that they would reorientate themselves if there were no temporary employment. However, temporary workers do not consider a return to permanent employment completely out of the question and state conditions that hospitals must meet to do so.

Management Cockpit: A New Step of the Development of Monitoring Approaches

Volker Busch (Fachhochschule der öffentlichen Verwaltung in Nordrhein-Westfalen und Hochschule des Bundes, Brühl)

An increasing number of economical, administrative and political institutions rely nationally and internationally on the idea to unify all important and controlling relevant information of the institutions data room and to provide it to a limited group of decision-makers. The development projects are oriented towards the leading idea of "Management Cockpits". The development perspective, which is quite logical, raises new questions and bears unidentifiable challenges, which are (1) What kind of options does the IT offer?, (2) How much information is a recipient able to process at its maximum? (3) Should indeed all the important information be condensed?,(4) At which point does the amount of information degenerate into a data graveyard? , (5) Considering a reasonable concept of escalation, which are the information one could forego? (6) Can you apply the "Idea of a Control Station" to all types of institutions?.Past experiences with regard to this cockpit technology and an outlook for the future development round off the presentation.

Local Public Finance in Libya: Learn to walk before you run

Jan Werner (Cologne Business School)

Libya is a unitary country, with the central government in the capital Tripoli, 22 districts, and 121 municipalities. The number of municipalities has already increased over the last few years, because - based on law 59 / 2012, in combination with decree number 180 / 2013 and decree number 540 / 2013 - the central government generated a total of 99 new municipalities. Those original 99 municipalities were split up further by the central government in several stages to create a total of 112 municipalities by July 2014. Nowadays there are 121 municipalities, 118 of which are already established, whilst three additional municipalities are in the process of being founded. To summarise the expenditure level, the legal framework delegates a huge number of expenditure areas – housing, planning, roads, basic health, securities, permits, water utilities, electricity – to the municipalities, but in reality the municipalities do not offer this huge number of public services to the people, because of capacity deficits of the local administration (knowledge as well as equipment), fiscal deficits (low volume of revenues as well as unpredictable revenue flows) and a lack of political willpower. For this reason, the paper provides six detailed recommendation for the future conception of the local public finance system in Libya.

Mobility Compass: An empirical survey of the development of student´s values regarding e-mobility

Christian Lucas (IUBH Duales Studium Düsseldorf)

The Mobility Compass is an annual online survey with first-year students between 18 and 25 years on the subject of electric mobility. Since recent surveys and scientific studies on mobility and electromobility show that the target of having one million electric cars on German roads by the year 2020 is unlikely to be met (see e.g. studies of the "Nationale Plattform für Elektromobilität"), the Mobility Compass tries to determine what needs to be done to make the electromobility topic interesting for future car buyers and users by determining the respective attitudes and image values of the young student target group. The aim of this study and research gap is thus the dedicated consideration of the "next" customers, that target group, which will decide in the next 5 to 10 years for a new car. Accordingly, special attention is given to the specific needs and interests of this young target group and therefore, for example, inter alia especially the market for small and compact electric vehicles examined in detail. The presentation will introduce the subject to be examined, put it up for discussion in the plenary session and explain how the topics and items will be already specified in qualitative and quantitative preliminary studies. Finally, it will be shown how the data will be processed in order to answer the pre-formulated research questions.

The Internationalisation Process of German Enterprises in Brazil: A brief empirical overview

Mariana Fleischhauer Corrêa da Costa & Jan Werner
(Cologne Business School)

The exchange between Germany and Brazil encompasses social, economic and cultural aspects. These countries have created strategic ties over the years promoting new business and developing opportunities that benefit both economies. However, there is still a great economic potential to be leveraged from this partnership. The last Brazilian presidential elections have raised several issues regarding economic growth and new possibilities to foster foreign direct investment in the country. The new Brazilian government is searching for international investors to boost the economy and take the country out of recession. In return, it promises to fight the main obstacles to international business: high bureaucracy and corruption. With one of the world's largest consumer markets, an abundance of natural resources and cheap labour, the country offers attractive conditions, especially for enterprises undergoing an internationalisation process. This paper will analyse the recent economic history of Brazil, explaining the major macroeconomic indicators and the social conditions of the country. With the collaboration of diverse German enterprises which expanded their business to Brazil and reported their experiences, relevant empirical cases and investment perspectives will be discussed. The study demonstrated that the future outlook for German endeavours in Brazil is very promising.

Panel III: Mobility in Logistics

Technologies and Processes Used by Food Delivery Services in Germany - An Exploratory Study Based on Twelve Expert Interviews and Two Time-Motion Studies services

Christian Straubert & Julia Metz (University of Bamberg)

Food delivery is an important market. According to a survey conducted in 2018, 9.5% of Germans ordered food home several times a month. For students, the figure is as high as 19%. However, the food delivery services in Germany have a reputation for technologically lagging behind and being processually unprofessional. This allegedly often results in long delivery times and faulty deliveries, which annoy customers. Although the industry is important and anecdotal evidence exists that there is great potential for optimization, to our knowledge there are no scientific publications on the operational processes and technologies used by food delivery services. This contribution is therefore designed as an exploratory study, which uses twelve expert interviews, and two time-motion studies to examine the processes and technologies used by the food delivery services in Germany. Our results confirm that customers indeed often criticize long delivery times and wrong deliveries. The use of better technology can effectively avoid both problems. In a comparison between a technologically advanced delivery service and a normally equipped delivery service, we measured a difference in the average total fulfilment time of more than 100%. However, technological upgrading is not always possible and is sometimes rejected by managers for various reasons. However, we have not observed any fundamental hostility towards new technologies on the part of the decision-makers. However, the use of Internet-based, externally operated ordering platforms is often rejected or viewed critically, because there are fears of becoming too dependent on the platform. Based on this exploratory study we deduce several research questions that could lead to a more efficient food delivery market. The operational quality of the food delivery services has a direct influence on the quality of our daily lives, as we are directly affected by poor service.

Die unternehmensinterne Logistik im Kontext der Digitalisierung und Industrie 4.0

Stefan Motschenbacher & Vanessa Felch (University of Bamberg)

Industrie 4.0 sowie Digitalisierung stellen zwei Megatrends der vergangenen Jahre dar. Beide beeinflussen bekanntlich alle Bereiche der Geschäftswelt und verändern den Wertschöpfungsprozess nachhaltig. In der Unternehmenspraxis ist die Digitalisierung als auch Industrie 4.0 besonders in der Produktion fortgeschritten. Keineswegs sind die beiden Trends auf die Fertigung beschränkt, sondern werden sich zwangsläufig auch auf andere Prozesse ausdehnen. Um die Vision von Industrie 4.0 zu verwirklichen, muss sich das gesamte Liefernetzwerk zu einem vernetzten und intelligenten Ökosystem entwickeln. Dabei spielen die Logistikprozesse eine integrale Rolle als Bindeglied zwischen den einzelnen Prozessschritten. Im Rahmen des Beitrags werden die Chancen und Potenziale, die der Einsatz von Industrie 4.0 und Digitalisierung im Rahmen der Intralogistik bieten kann, den Herausforderungen und Risiken gegenübergestellt. Um die entscheidenden Faktoren zu identifizieren, wurde zunächst der aktuelle Stand der Forschung mittels systematische Literaturanalyse erhoben. Ehe diese anschließend mit Einschätzungen aus der Praxis abgeglichen wurden. Die Ergebnisse der qualitativen Studie identifizieren Herausforderungen bezüglich der Themengebiete Kosten, Mensch und Mitarbeiter sowie Markt und Technologie. Demgegenüber stehen die Chancen in den Bereichen Effizienz und Transparenz, Big Data als auch bei Mensch und Mitarbeiter, welche der Einsatz von Industrie 4.0 und Digitalisierung im Rahmen der Intralogistik ermöglichen kann.

Acceptance of web-based EDI applications by small and medium-sized enterprises

Andreas Ott & Alexander Dobhan
(University of Applied Sciences Würzburg-Schweinfurt)

Abstract: Since the 1980s, the exchange of operational data between Enterprise Resource Planning systems via Electronic Data Interchange (EDI) has been an important component of cross-company communication and has been an essential element for planning material flows throughout the entire supply chain in large companies for a long time. The question is to what extent EDI and, in particular, web-based EDI (WebEDI) as an easy to use variant of EDI has been able to establish itself in small and medium-sized companies (SMEs) and what possible impediments and reasons for rejection occur. This question is even more important because its answer helps to overcome the obstacles for the acceptance of new technologies for message exchange between the systems of different organizations (and within the organization) for SMEs within the framework of Industry 4.0. The possible impediments and rejection arguments of EDI can be transfered to the implementation of industry 4.0 in SMEs and helps to initiate activities for avoiding these obstacles. This article therefore examines the acceptance of WebEDI by SMEs. Furthermore, the current state of research is critically analysed. For this purpose, the literature basis is set up using a search formula in established search engines for scientific literature. The qualitative and quantitative analysis of the literature referred to relies on several categories derived from the research question. The findings allow decision makers to foster the dissemination of new technologies for cross-company data transmission, such as within the framework of Industry 4.0, or to enable it via EDI.

Panel IV: Mobility in Engineering

Climate Protection in the Transport Sector – The Key Role of Alternative Fuels

Thomas Willner (Hamburg University of Applied Sciences)

The German government is preparing a climate protection law. One result of the supporting working groups in the national platform future of mobility (NPM)[1] is that the climate targets for the transport sector are not achievable in time with electric mobility alone. Alternative fuels in particular will play a key role in reducing greenhouse gas emissions in the existing car fleet and in areas difficult to electrify such as heavy-duty transport, aviation, marine shipping and numerous special applications. In addition, hybrid cars will need liquid fuels in the long term. The presentation starts discussing the importance of alternative fuels for climate protection in the context of available technologies. Regarding liquid fuel demand, representative production pathways are shown mainly according to the position paper "Advanced alternative liquid fuels: For climate protection in the global raw materials change"[2] of the ProcessNet,[3] a joint initiative of DECHEMA and VDI-GVC. These pathways include fat based technologies, XtL synthesis gas technologies (e.g. PtL: Power to Liquid, BtL: Biomass to Liquid, WtL: Waste to Liquid or GtL: Gas to Liquid), direct liquefaction technologies (e.g. pyrolysis, hydrothermal and solvothermal liquefaction) as well as biorefinery technologies. An outlook addresses expected fuel prices, available raw-material resources and ramp-up scenarios for alternative fuel technologies.

[1] https://www.plattform-zukunft-mobilitaet.de/

[2] https://processnet.org/en/-p-1000035-EGOTEC-d8424ee141ed691f1b724e395cb8e954/_/PP_Alt.Brennstoffe%202018_engl_ezl.pdf

[3] https://processnet.org/

Fuels from Waste and Hydrogen – The HAW Hamburg Approach

Anika Sievers & Thomas Willner
(Hamburg University of Applied Sciences)

Approximately 95 % of the global transport sector is still based on liquid fuels. Thus, advanced alternative liquid fuels will gain importance for rapid reduction of greenhouse gas emissions in future mobility. These alternative fuels should not compete with food but be based on waste and renewable energy sources. Related to advanced alternative fuels the presentation will show first results of the joint project "X-Energy" of the Hamburg University of Applied Sciences (HAW Hamburg) with partner companies. The subproject "READi™-PtL (Power to Liquid)"[4] is investigating a novel approach of a two-step conversion of fatty waste material into drop-in fuels. The first step is applying an innovative reactive distillation process (READi™ process) for both adjusting the molecular chain length distribution and reducing the oxygen content. The second step is upgrading the intermediate product CVO (cracked vegetable oil) into drop-in fuel components HCVO (hydrotreated cracked vegetable oil) by hydrotreating with hydrogen from renewable energy. Features of this approach are high energy-efficiency and low production costs due to comparatively low hydrogen demand. Goal of the project is verifying the new READi™ process in pilot plant scale together with the partner company Nexxoil. Finally, the presentation gives an outlook related to the expansion of the raw material basis for the READi™ process towards other waste sources such as residues from oil recycling, plastic waste and lignocellulosic waste.

[4] https://www.haw-hamburg.de/cc4e/x-energy/readitm-ptl.html

A new Negative Emission Technology (NET) producing at low cost large amounts of negative CO2-Emissions and large amounts of 100%-GHG-neutral BioMethane for the transportation sector

Michael H. Feldmann (Phoenix-IP B.V. & Clean Mobility Systems)

In its newest special report "1,5°C" IPCC came to the conclusion that it will not be possible to keep climate warming below 2°C unless NETs accelerate reduction of GHG-emissions and compensate for unavoidable CO2-emissions. The start-up Phoenix Intellectual Property developed the new NET "BE-CCR-BC-CCS-SCA" for the transportation sector which makes use of approved biogenic residues only. The disruptive moonshot technology improves soil carbon levels, triples available biomass potential, and provides a global potential of up to 4 Gigatons of negative CO2-emissions per year plus 3.000.000 – 4.000.000 GWh of GHG-neutral BioMethane. Fuels are distributed via existing CNG- and LNG-infrastructure. By-products are certified harmless biochar, liquefied atmospheric CO2, and so-called Advanced Fuel Quotas. The production process is RED-conform and will be certified by RSB. Due to its negative CO2-emissions Phoenix and its parent company Clean Mobility Systems (CMS) are able to compensate cradle to grave (CtG) for all CO2-emissions of a car including its CO2-rucksack resulting from production. In terms of CO2 this recently TÜV- and RSB-approved technology makes true zero emission possible – on the basis of ICEs. However, due to the virtual character of its main product it is able to also clean up BEVs, PHEVs, and any other vehicle like i.e. heavy long-haul Diesel trucks.